absence of bees. This, however, is hardly correct, for there are several species of native bees in New Zealand which constantly visit composite flowers. But *Pleurophyllum speciosum* has very conspicuous purple flowers, although it is found only in Campbell and Auckland Islands, where there are no bees or flower-visiting moths. Nor does it stand alone, for *Celmisia vernicosa*, and its ally *C. chapmani*, are the only species of the genus with purple discs, and yet they also are only found in Campbell and Auckland Islands. In *C. vernicosa*, also, the leaves have become rigid, although no animal feeds upon it.

I think that these facts are of sufficient interest to bring to the notice of botanists, at a time when, perhaps, we too readily accept selection as the explanation of every character. For in these Antarctic islands the conditions of life are so simple that we can eliminate many causes which complicate the same problems in areas with more varied life.

F. W. HUTTON.

Christchurch, New Zealand, May 23.

The Origin of Variation.

THE following argument may be of interest to your readers, if, as I suspect, it has never been thus formulated before.

In order to account for the origin of species, we must assume that the tendency of an individual to vary is handed down to future generations by appropriate modifications in the transmitted germ-plasm. But, unless we believe in the inheritance of acquired characters (for which we have no certain evidence), the tendency of the first individual to vary can only have become manifest if it had originated in a modification of its own parents' germ-plasm; otherwise that tendency could not have been inherited. Leaving out of account the play of changing external conditions, we are thus forced to regard the variability of individuals as the result of variations in the parental germ-plasm. The problem is, how are such variations produced?

CHARLES S. MYERS.

Gonville and Caius College, Cambridge, June 29.

THE BRITISH ASSOCIATION.

THE Southport meeting of the British Association will begin on Wednesday, September 9. The local arrangements, which have been in the hands of a large and representative committee for many months past, are now well advanced, and give every indication that the meeting will not fall short of that held in Southport twenty years ago.

It was not without fear and misgiving on the part of some of its more prominent members that the Association visited Southport in 1883, but the success of the meeting in the northern watering-place was so conspicuous that at the final general meeting there was a unanimous expression of opinion that the Southport meeting of 1883 had been one of the most successful ever held, and a desire to repeat it at some future date. The meeting then stood sixth in point of numbers, and third in receipts. Since that date the Southport meeting has only been exceeded in numbers by the meetings in the neighbouring cities of Manchester and Liverpool, and in receipts by Manchester alone. 2714 people attended the meeting of 1883, and it is confidently hoped that this number will be exceeded in 1903.

The Corporation of Southport is working with the local committee to make the meeting a success, and has placed at its disposal the handsome suite of Municipal Buildings for use during the week of the Association's visit. These buildings include the Town Hall, Cambridge Hall, Art Gallery, and Victoria Science and Art Schools. The three first named of these were in use at the former Southport meeting of the British Association, but they were then without direct communication one with another. They are now connected by corridor bridges, and form an admirable suite of rooms for municipal and other social functions. The Victoria Science and Art Schools occupy a site behind the Cambridge Hall, with which, as well as with the Art Gallery, they are connected on the first floor, thus forming a further addition to the suite of reception rooms. This block of Municipal Buildings, which stands directly in the centre of the town, facing Lord Street, will be the headquarters of the Association. The reception room will be situated in the Examination Hall of the Science and Art Schools, the entrance being by the main doorway of Cambridge Hall. It is proposed that the Examination Hall shall be used for counter business only, the large room of the Art Gallery close by being used as a second reception room for conversational and general purposes. Two other of the picture galleries will be set apart for reading and writing rooms, whilst a fourth will be allotted to the representatives of the Press.

Three of the sections will meet in the Science and Art Schools, viz. Sections A (which is in two departments, Mathematics and Astronomy), B (Chemistry), and G (Engineering). Section L (Education) will meet in the Cambridge Hall, and Section H (Anthropology) in the Town Hall. Five out of the ten sections meeting this year will thus be located in the Municipal Buildings, and in easy communication one with another.

The council of the Association will meet in the council chamber of the Town Hall, and here also the general committee and the council of recommendations will hold their meetings. Two of the Corporation committee rooms in the Town Hall have been set aside for the deliberations of the International Meteorological Committee, which is meeting in Southport at the same time as the British Association, and of which a notice has already appeared in NATURE (May 14).

The laboratory of the Science and Art Schools will be used as a meteorological museum, and for the reception of apparatus and specimens illustrative of papers communicated to the sections.

The remaining five sections are all located in buildings within three minutes' walk of the reception room. Sections D and E (Zoology and Geography) will meet in the Temperance Institute, London Street, Section C (Geology) in Hoghton Street Church schoolroom, Section K (Botany) in Chapel Street Church schoolroom, and Section F (Economics), in the Y.M.C.A. building, Eastbank Street. The conference of delegates of corresponding societies will have two rooms placed at its disposal in Chapel Street Schools. All these buildings lie close to one another, and are easily reached by trams from all parts of the town.

The first general meeting of the Association will be held on Wednesday evening, September 9, at 8.30, in the Opera House, when the president, Sir Norman Lockyer, will deliver his inaugural address.

The Friday evening discourse will be delivered by Dr. Robert Munro, on "Man as Artist and Sportsman in the Palæolithic Period." On Monday evening a discourse will be given by Dr. Arthur Rowe on "The Old Chalk Sea, and some of its Teachings." The Saturday evening lecture to working men will be given by Dr. J. S. Flett, his subject being the recent volcanic eruptions in the West Indies. All these three lectures will be delivered in the Cambridge Hall, which seats about 1500 persons.

On Thursday evening the Mayor of Southport (Mr. T. T. L. Scarisbrick) will give a reception in the Municipal Buildings, and the local committee will give a conversazione in the same place on September 15.

The Mayor will further give a garden party in Hesketh Park on Friday afternoon, and Sir George Pilkington gives a garden party to a limited number of members at his residence, Belle Vue, on the afternoon of Monday or Tuesday, September 14 or 15.

The sections will not meet on Saturday, September 12, that day being set apart for excursions. Six whole-day and two half-day excursions have been arranged, and provision has been made in all for about a thousand persons. The excursions will be to (1) Manchester, visiting the works of the British Westinghouse Electrical and Manufacturing Company at Old Trafford. Opportunity will also be given of inspecting the new Technical School, the John Rylands Library, and the Chetham Hospital; (2) Stonyhurst College and Whalley; (3) Ribchester and Hoghton Tower; (4) Windermere; (5) Chester; (6) The Wirral Peninsula. Specially prepared pamphlets will be issued as guides to the excursions. The Westinghouse Co. has kindly promised to entertain the Manchester party to luncheon, and similar hospitality has been offered by the authorities at Stonyhurst College and by the Chester Society of Natural Science, Literature, and Art at Chester. The afternoon excursions on Saturday comprise drives to Hoole (the scene of the labours of Jeremiah Horrocks, the astronomer), Rufford Old Hall, and the ancient churches of Ormskirk and Halsall.

On the concluding day of the meeting, Wednesday, September 16, the following unofficial excursions have been arranged for the afternoon:—(1) Port Sunlight, Cheshire, Messrs. Lever's model village and soap works; (2) the Diamond Match Works at Seaforth, Liverpool; (3) the Cunard s.s. *Lucania* at Liverpool. On the Thursday following the meeting, opportunity will be afforded of visiting the Prescot Watch Works (a revived Lancashire industry), the British Insulated Wire Co.'s works at Prescot, the Lancashire and Yorkshire Railway Co.'s works at Horwich, and two collieries at Wigan. It has also been arranged for a steamer to run to Llandudno on this day.

Southport has made rapid advances in every direction during the last twenty years. Since 1883 much of the town has been rebuilt, the promenade has been widened, the marine parks and lake constructed, and many other important works of improvement have been effected. The Municipality of Southport is in the forefront of local government, and to its enterprise is in a large measure due the remarkable development of the town in recent years. Lord Street, the principal thoroughfare of the town, is a magnificent boulevard a mile long and more than eighty yards wide, with broad footways bordered by trees, suggesting comparison with the streets of continental rather than with those of English cities. The Municipal Gardens in Lord Street, in front of the Town Hall and Cambridge Hall, have become since last year, especially for visitors, the centre of life and movement in the town. Here the Corporation Military Band plays two or three times daily, and at night the trees are lit up with thousands of electric lights, the effect being striking and unique.

A handbook, or guide to the district, is being prepared, a copy of which will be presented to each member attending the meeting. The book will be illustrated and will contain specially prepared maps illustrating the topography and geology of the district. The district, roughly speaking, is that portion of south-west Lancashire lying between the rivers Ribble and Mersey.

The following subjects will be dealt with in the handbook:—"Sketch of the History of Southport"; "Meteorology," by Mr. Joseph Baxendell, Borough Meteorologist; "Health," by Dr. J. J. Weaver, Medical Officer of Health; "Geology and Physical Features of the District," by Mr. E. Dickson and Mr. H. Brodrick; "Botany," by Mr. Henry Ball and Mr. W. H. Stansfield; "Marine Zoology," by Prof. W. A. Herdman, F.R.S., and Mr. Isaac C. Thompson; "Coleoptera," by Dr. G. W. Chaster and Mr. E. Burgess Sopp; "Mollusca," by Dr. G. W. Chaster; "Mosses," by Dr. J. A. Wheldon; and "Antiquities," by Mr. W. Brunt. Mr. G. Napier Clark is contributing a chapter on Jeremiah Horrocks, the astronomer, and his connection with the district. The scientific portion of the handbook is being prepared under the direction of the Southport Society of Natural Science, and the general editors are Dr. G. W. Chaster, Mr. Geo. E. Johnson, and Mr. F. H. Cheetham.

In connection with the meeting and with the excursions, the following notes on the Southport district will be of interest. For the paragraph dealing with geology I am indebted to Mr. Harold Brodrick, for those on botany to Mr. Henry Ball, and for those on zoology to Mr. Isaac C. Thompson.

Geology.—The geology of the Southport district has for the most part to do with the Glacial and post-Glacial deposits. Of the older formations only comparatively small areas are exposed, having been entirely covered by Glacial deposits which have only in few places been denuded to the underlying strata. In the neighbourhood of Parbold, some ten miles inland, is a good exposure of Millstone Grit, while the Coal-measures may be well seen about Wigan, the Wigan coalfields being some of the most productive in England. Two small sections of the Permian rocks, with a thin stratum of a true magnesian limestone, may be examined in the beds of two small streams near Parbold. These beds have been proved to be fossiliferous, but only slightly so, not more than a dozen fossils in all having been found in them. Underlying the Boulder-clay, within eight miles of the coast and exposed in several places, are considerable deposits of the Keuper and Bunter divisions of the Trias.

In probably no part of England can that combination of clay, sand and gravel known as the Glacial Drift be better studied than in this district. Overlying the older formations, in some cases to a depth of more than one hundred feet, the Boulder-clay has suffered both denudation and erosion. By the latter action a range of prehistoric sand-dunes has been formed several miles inland of the present coast. These dunes offer several exceedingly interesting problems, and papers will be read before the Geological Section on this subject. Further inland, near Tarleton, are several large deposits of Glacial sand and gravel containing a considerable number of shells of an arctic type.

The Boulder-clay itself is of great interest, containing, as it does, boulders of Silurian Grits and Carboniferous Limestone from north Lancashire, Eskdale and Buttermere granites, and also several local granites and grits from the south-west of Scotland. These clays also contain a large number of Foraminifera, mostly of an arctic type.

A very large area is covered by peat mosses which have formed in the beds of old lakes and also covered the surrounding districts. These peat mosses in places are twenty feet in depth, and in them many canoes hollowed out of single tree trunks have been found. One of these, 17 feet long, will be on view during the visit of the Association.

The coast is fringed with a line of sand-dunes for a distance of some fifteen miles, while the whole of Southport is built on ground formerly covered with dunes, which have been levelled; in some places, as near Formby, six miles south of Southport, these dunes are more than three miles in width and rise to a height of more than 80 feet. The sand of the dunes is composed of materials eroded from the Triassic sandstones and then cast on to the shore by the sea, from where it is blown into dunes by the prevailing westerly winds. A considerable area in the estuary of the Ribble to the north of Southport is covered by a salt marsh formed by the deposition of silt at the meeting of the waters of the Ribble with those of the sea. This district is of considerable interest, as in it may be studied the question of the formation of estuarian clays and their attendant flora and fauna.

On the whole, although at first sight the district does not seem to offer many opportunities of study to the geologist, yet on further consideration many problems and objects of great interest are to be found.

Botany.—Turning to the flora of the district, we find that, in spite of the apparent bareness of the long stretch of sand-dunes, they are by no means barren from a collector's point of view. In addition to the usual littoral flora, which is even here thoroughly representative in variety, nature, and outline, the diligent seeker will be rewarded by many choice finds. We must be pardoned for placing as an easy first, in regard to beauty as well as variety, the seaside form of the round-leaved winter-green, *Pyrola rotundifolia,* Linn., var. *maritima,* Kenyon. This plant is here abundant, and when in full bloom is an object of great loveliness. Here also, nearer to the sea line, may easily be found quite a family group of the centaurys (locally termed sanctuary). Every species now recorded in the London catalogue, save one, has been gathered on this coast. The rarest of them, however, the broad-leaved centaury, *Erythraea latifolia,* though originally found here, seems to be now extinct. Accompanying these plants there occurs, sometimes in patches like small fields, another member of the same natural order (Gentianeæ), the yellow-wort, *Blackstonia perfoliata,* Hudson, whilst in similar patches, and even more luxuriantly, there grows the Grass of Parnassus, *Parnassia palustris,* Linn. In higher and drier situations, too, the searcher is rewarded by the discovery, in fairly large quantities, of two beautiful euphorbias, both comparatively rare elsewhere, namely, *Euphorbia Paralias,* Linn., and *E. Portlandica,* Linn. The latter is a lovely object in the autumn, its green foliage changing to a bright crimson as the plant gradually fades.

The aquatic plants of the district are well worthy serious study, and include a very interesting group of drop-worts (Œnanthe), marestail, *Hippuris vulgaris,* Linn., and a few miles inland whole dykes covered over with the beautiful water-violet, *Hottonia palustris,* Linn. To refer once more to the sand-dunes, the collector may be interested to know that here grows that wonderful botanical enigma, the yellow bird's nest, *Hypopitys Monotropa,* Crantz, and a capital variety of orchids, including *Epipactis palustris,* Crantz. On the whole, to anyone in search of British wild flowers, the district is rich and repaying.

Zoology.—With the exception of its marine fauna, which is very rich, and is to be specially dealt with in the handbook now in preparation, Southport cannot be said to possess any very distinctive zoological features. No quadrupeds are peculiar to the district. But in early times, probably succeeding the last Glacial epoch, when the flat country around Southport was more elevated than now, it is evident that the Irish elk, *Cervus megaceros,* roamed here in abundance, many skulls and other remains of this animal having been found embedded in the clay beds of a large inland lake no longer existing, known as Martin Mere. It is suggested by Mr. G. W. Lamplugh, in his recent geological survey of the Isle of Man, that the Irish elk migrated across the waning ice-sheet which lingered in the Irish Sea at the close of the Glacial period.

In ornithology Southport bears a good record, and though the number must have been decreased of late years, no less than 130 species of birds were known to the district half a century ago. Among the birds that now visit the neighbourhood during spring and summer are the swallow, stone-chat, white-throat, yellow wagtail, northern diver, snow bunting, black and little tern, and wheatear, for many of which the numerous sandhills offer congenial attractions. In winter the bodies of storm-tossed birds, as the puffin, razor-bill, and stormy petrel, are often cast upon the shore, or become entangled in the fishermen's nets.

Numerous lizards haunt the sandhills, where also the conchologist will reap a good harvest not only in land mollusca, which are very abundant, but in marine species, including some of which no representatives are now found on the shore, and which were, doubtless, deposited at a distant era when the sea covered much of the present land. Cockles and shrimps are yet taken at Southport in great abundance. To the entomologist the sandhills of Southport afford a valuable hunting ground, as will be seen from the number of species and genera recorded in the forthcoming handbook.

Archaeology.—The district of Southport is not so destitute of interest to the antiquarian as might at first be supposed. Southport itself can boast no history prior to the end of the eighteenth century, but Birkdale and Churchtown, at the two extremes of the borough, can both claim a respectable antiquity. Roman coins are said to have been found on Birkdale Common.

This part of Lancashire is the "Inter Ripam et Mersham" of the Domesday Survey, but the antiquarian interest goes back to Roman times, when there were Roman stations on both the Mersey and Ribble, a Roman road leading from what is now Warrington through Wigan to Ribchester. The country west of the line of this road was, until comparatively recent times, very isolated, and consisted largely of low, swampy ground interspersed with woods and growing timber. The Roman station at Ribchester will receive the attention of the members of the British Association on one of the Saturday excursions, when Mr. John Garstang, of University College, Liverpool, and author of "Roman Ribchester," will explain the history of the Roman occupation on the site. Mr. Garstang will also read a paper on Roman Ribchester before Section H.

Close to Southport is the site of Martin Mere, once a large shallow fresh-water lake. It is now drained and used as agricultural land. Mention has already been made of a large canoe dug up here, and it is hoped that other antiquities (bronzes, &c.) obtained from the site of the lake may be on exhibition at the time of the meeting. Martin Mere is one of the many places which claim connection with the Arthurian legend. The river Douglas, the whole course of which lies within this district, is reported to be the scene of some of King Arthur's most bloody battles! Claims are also put forward by both the Ribble and Mersey, north and south of Southport, as the site of Athelstane's great victory of Brunanburg.

Lancashire is rich in old halls, and many of these are within easy reach of Southport. Visits will be paid to Rufford Old Hall, which contains a very fine example of a great hall of the fifteenth century, and to Hoghton Tower, an interesting and finely situated Elizabethan mansion, recently restored, the residence of Sir James de Hoghton, Bart. Hoghton Tower disputes with Pimp Hall, Essex, the title of being the house in which King James I. knighted the loin of beef. Of the lesser halls in the immediate vicinity of Southport, mention may be made of Lydiate, Hurleston, Mawdesley, and Heskin. Larger houses, like Speke and Smithells, lie further afield, and can only be visited by special permission.

In ancient ecclesiastical architecture Lancashire cannot be said to be well off. There is an ancient Norman chapel at Stydd, near Ribchester, an opportunity of visiting which will be given, but otherwise nearly all the churches of Lancashire belong to the late Perpendicular period. Halsall, however, four miles from Southport, possesses a fine parish church, largely of fifteenth century date, which will be visited, and the church at Ormskirk is unique in England in possessing a western tower and spire standing side by side. Sefton church is a late sixteenth century building, with remains of earlier work in parts, and has some good interior woodwork. At Burscough, eight miles distant, are the remains of an Augustinian priory, which in its day was one of the most considerable religious houses in Lancashire.

Carr House, at Hoole, a brick building erected in 1613, is reputed to be the house in which Jeremiah Horrocks observed the transit of Venus in 1639, and Hoole Church, though without architectural merit of any kind, is interesting as the chapel at which Horrocks officiated. There are the remains of a large number of wayside crosses in this part of Lancashire, an excellent specimen standing in Scarisbrick Park, about four miles from Southport.

Lathom is the scene of the famous siege of Lathom House by the Parliamentary forces in 1644, where Charlotte de la Tremouille, Countess of Derby, made her famous defence. She is buried along with the Earl in the neighbouring church of Ormskirk. Old Lathom House has given place to a classic mansion erected in 1724–34 from the designs of Leoni. Scarisbrick Hall is another old Lancashire mansion that has been rebuilt, the modern house, designed by Augustus Welby Pugin, being a fine example of the domestic work of the Gothic revival.

All along the coast of Lancashire are evidences of submerged lands, and the interest of the Leasowe coast of the Wirral Peninsula is well known to all those who have inquired into the subject of the alteration in the coast line of the country since Roman, or even Norman, times. An opportunity will be afforded of inspecting the submerged forest at Leasowe, and another submerged forest is to be seen nearer to Southport, at the mouth of the Alt, near Formby.

Of places not falling within the Southport district, but which will be visited by the Association, the antiquarian interest of Chester is too well known to need comment. At Whalley are the remains of a great Cistercian abbey, and Whalley church is a building full of architectural and antiquarian interest from the thirteenth to the sixteenth centuries. It contains the stalls belonging to the abbey church, which has completely disappeared. In the churchyard are three pre-Norman crosses. Time may allow also of a visit to Mytton church and Little Mytton Hall, which lie between Whalley and Stonyhurst. Stonyhurst itself has some antiquarian interest, the original building being a fine Elizabethan house, now incorporated in the vast college buildings. At Manchester mention must be made of the fifteenth century Chetham Hospital and Library, adjoining the Cathedral.

The archæology of the immediate district of Southport may be described as of local rather than of general interest, but a reference to the volumes of proceedings of the Historic Society of Lancashire and Cheshire, and of the Lancashire and Cheshire Antiquarian Society, which will be found in the Southport Reference Library, will show that antiquarian research is very active in the two counties.

The railway companies will issue return tickets to Southport from the principal stations in the United Kingdom at a fare and a quarter on surrender of the usual voucher issued to members. The tickets will be available from September 8 to September 18 inclusive. The local railway companies will issue return tickets at a fare and a quarter to members during the meeting for short distance journeys.

F. H. Cheetham.

NEW SERUM DEPARTMENT OF THE JENNER INSTITUTE.

Upon the invitation of Lord Lister and the governing body of the Jenner Institute of Preventive Medicine, a number of distinguished guests inspected, on Friday last, the new laboratories and stables which the institute has recently acquired at Queensberry Lodge, Elstree, Herts.

The removal from the former site at Sudbury, near Harrow, became necessary from the encroachment of the Great Central Railway, and the authorities of the institute were fortunate in acquiring a site which is eminently suitable for carrying on the work of the department. This work consists largely in the preparation and testing of antitoxins, such as diphtheria antitoxin, tetanus antitoxin, and antistreptococcic serum, and in carrying on research work in connection with these, and on questions of immunity.

Certain researches also in comparative pathology can be suitably conducted only under such conditions as exist in a department of this character.

The buildings are on the summit of a small hill, and are surrounded by about twenty-eight acres of meadow land, which is conveniently divided into small fields suitable for pasturing and exercising the horses and other animals, such as goats and sheep, which are used in connection with the work. Queensberry Lodge itself has been retained practically as it was when the estate was acquired by the institute, and is now used for the accommodation of the junior staff, administrative offices, &c. The bacteriologist-in-charge lives in a separate house. The laboratories, which have been built by the institute from designs by Mr. Paul Waterhouse, are of the most modern type, with papyrolith floors with rounded corners, white glazed adamant walls with a dado of white tiles, and large window space. They are warmed by open fireplaces. There is a good gas and water supply, and the buildings are lit by Welsbach incandescent gas burners. The main ideas in the arrangement of the departments have been to provide separate buildings and isolated rooms for carrying out the different processes for the production and testing of antitoxins, thus avoiding risk of contamination of the serum, and at the same time affording adequate laboratory accommodation for the prosecution of research work. In this connection it has been considered advisable to have several small laboratories for one or two workers where undisturbed work can be carried on rather than large laboratories capable of accommodating a number of workers.

The laboratories comprise:—

A Large Routine Laboratory.—This room is furnished with both side and roof lights, and is fitted with centre and side benches, fume chamber, &c. It is used for general chemical work, for the filtration of diphtheria toxins, for fitting up apparatus, and for such work as section-cutting and blow-pipe work.

Two Private Research Laboratories.—These rooms are well lighted with a north-east aspect. They are completely equipped as bacteriological laboratories, have low benches for microscopical work, and separate Hearson incubators, shelves for reagents, media, &c.

The Serum Laboratory.—The windows in this room are of ruby glass so as to ensure a non-actinic light. It is used for the filtration and storing of the various sera, and contains two large ice-safes for that purpose. It is fitted with a work bench which has connections with a water-vacuum pump, and is also furnished with a Geryk pump.

The Engine Room is fitted with a gas engine driving a large Runne's centrifugal machine and a disintegrator. There is also a Root's blower, which supplies sterile air to the bottling room. There is a water-pump supplying a vacuum and high-pressure air to the neighbouring rooms.